



GPCS459

Good Practice
Case History

CHP at a paper mill
Kappa Packaging



Kappa Packaging

Combined heat and power (CHP) offers significant cost and environmental benefits as demonstrated through the installation of two CHP units at Kappa Packaging's paper mill in Birmingham, which has resulted in:

- **£500,000 reduction in operating costs in 2003/04**
- **Climate Change Levy discounts worth £80,000/year**
- **Provision of 90-100% of the site's electricity requirements and 80-100% of its heat requirements by the CHP units alone**
- **Tax benefits from Enhanced Capital Allowances on component parts.**

Company profile

Kappa Packaging is one of Europe's largest companies for the production, development and sale of container, solid, graphic and specialty board and corrugated packaging.

The company's paper mill in Birmingham produces 180,000 tonnes/year of packaging-grade brown paper from 100% waste-based furnishing. Last year, the site used nearly 500,000MWh of energy. In the last two years, the mill has invested £1 million in heat management.



Combined heat and power (CHP)

CHP, also termed cogeneration, is the simultaneous generation of power (usually electricity, but also mechanical power) and usable heat in a single process. The three key elements of a CHP plant are the prime mover (reciprocating engine, gas turbine, steam turbine, or a combination of these elements), the generator (or mechanical drive) and the heat recovery equipment. It is possible to use the heat to provide cooling, via the use of absorption chillers. Where power, heat and cooling are provided, this is often termed tri-generation.

When correctly designed, the overall efficiency of a CHP system can be in excess of 85% and when the electricity is used locally, transmission and distribution losses are also minimised. CHP can thereby contribute significantly to the primary energy, cost and carbon savings of a site.

CHP schemes that are certified as being Good Quality under the CHP Quality Assurance Programme are eligible for a range of fiscal benefits (e.g. Climate Change Levy exemption, Enhanced Capital Allowances and exemption from business rates).

Comments from Kappa Packaging



"The paper industry, with its high heat-to-power load, is ideally placed to make maximum advantage of CHP. Even in the most disadvantageous energy markets, our CHP plants continue to provide significant additions to the company's bottom line. Hopefully, the energy markets will swing back so that further significant savings will result in the near future."

Alan Clarke

Works Electrical Engineer, Kappa Packaging

CHP at Kappa Packaging

Kappa Packaging operates two CHP units at its Birmingham site:

- A 3.5MWe gas turbine unit purchased in 1985
- A 5MWe gas turbine unit purchased second-hand from a Dutch company in 2000.

The heat from the turbine exhaust is used to produce steam. This steam is fed into the process to dry the paper and displaces fuel that would have been burnt in boilers to produce the steam required.

Routine maintenance for the 3.5MWe unit is provided under a contract with its supplier. The same company is also contracted to provide all-inclusive maintenance for the 5MWe unit.

Benefits to Kappa Packaging

Kappa Packaging has realised the following financial and environmental benefits of installing CHP at its paper mill in Birmingham:

- Operating costs reduced by some £500,000 in 2003/04. Further savings are expected in 2004/05
- Using both units, Kappa can satisfy 90-100% of its electricity requirements and 80-100% of its heat requirements

- CHP has proved essential in allowing Kappa Packaging to reach the energy efficiency criteria set out in its Climate Change Agreement (CCA), thus saving it £80,000/year through Climate Change Levy discounts
- Good quality CHP, as certified by the CHP Quality Assurance Programme, allows further savings beyond the company's CCA
- Ease of maintenance and management through specialist control systems means that both units are, effectively, unmanned.

Contact the CHP Club for further information

If you would like information on any aspect of CHP, the CHP Club from the Carbon Trust is here to help. The Club provides impartial help and advice, and membership is free. Benefits include:

- Practical guidance
- Up-to-date news
- Events and site visits
- Site-specific advice including CHP feasibility assessments.

For additional information please visit www.chpclub.com or ring the Carbon Trust Energy Helpline on 0800 58 57 94.

Tel 0800 58 57 94

www.thecarbontrust.co.uk/energy

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The Carbon Trust works with business and the public sector to cut carbon emissions and capture the commercial potential of low carbon technologies.

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